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"Vaccination against Tuberculosis," C. A. Julian, Thomasville.

"The Geological History of Western North Carolina," J. H. Pratt, State Geological Survey, Chapel Hill.

"Action of Ammonia upon Arsenic Iodide," C. H. Herty and J. T. Dobbins, University of North Carolina, Chapel Hill.

"A List of the Known Homoptera in North Carolina," Z. P. Metcalf, Agricultural and Mechanical College, West Raleigh.

"The Chestnut Bark Disease," S. C. Bruner, Agricultural and Mechanical College, West Raleigh.

"Serum-simultaneous Method of Immunizing Hogs against Cholera," W. C. Chrisman, State Department of Agriculture, Raleigh.

"Behavior of the Spermatozoa of the Crab," Raymond Binford, Guilford College.

"The Granville Tobacco Wilt Problem," H. R. Fulton, Agricultural and Mechanical College, West Raleigh. (Read by S. C. Bruner.)

"The Swamp Lands of Eastern North Carolina," J. H. Pratt, State Geological Survey, Chapel Hill.

"The Influence of Environment on Reproductive Processes," W. C. Coker, University of North Carolina, Chapel Hill.

"Survivals and Adaptations along the South Atlantic Coast: A Study in Anthropogeography," Collier Cobb, University of North Carolina, Chapel Hill. (Read by title.)

"A New Interference Apparatus" (with a demonstration), C. W. Edwards, Trinity College, Durham.

"The Closing Up of Lake Basins in Massachusetts, Michigan and North Carolina," Collier Cobb, University of North Carolina. (Read by title.)

E. W. GUDGER,
Secretary

STATE NORMAL COLLEGE,
GREENSBORO, N. C.

SOCIETIES AND ACADEMIES

THE ACADEMY OF SCIENCE OF ST. LOUIS

At the meeting of the academy on March 3, Dr. R. J. Terry, of the Washington University Medical School, read his second paper on "The Development of the Cranium in Mammals."

Dr. Terry stated that Weiss's study of the occipital region of embryos of white rats revealed the fact that the dens epistrophei in these animals is composed of two elements, the one generally

recognized as comparable with a centrum for the atlas, the other lying cephalad of this and forming the extremity of the dens. The latter is derived by independent chondrification in the tissue about the notochord cephalad of the atlas and where the former crosses the dorsal surface of the basal plate of the cranium. Weiss regarded this cephalic element as representing the centrum of an occipital vertebra or a proatlas.

The presence of an element in the dens epistrophei of cat embryos has been observed developing cephalad of the component identified as the centrum of the atlas and extending upon the basal plate of the cranium. This component is derived from the mesenchyma which, in the form of a cone traversed by the notochord, extends from the level of the atlas cephalad upon the basal plate and there lies in a deep median groove. Chondrification in this part of the dens occurs later than in that part related to the atlas, but the two processes appear not to be entirely distinct.

At the meeting of April 21 Professor R. A. Hall, of Washington University, stated to the academy that he had succeeded in preparing neutral tri-ammonium citrate in commercial quantities.

Professor Hall described a method in which neutral tri-ammonium citrate was prepared by passing an excess of dry ammonia gas into a well-cooled solution of the water-free citric acid in an anhydrous solvent.¹ The yield is quantitative. Tri-ammonium citrate thus prepared is a stable, white crystalline substance, not hygroscopic and not affected by the CO₂ of the atmosphere. It dissolves readily in water and the freshly-prepared solution is neutral to sensitive litmus, azolitmin, corallin, methyl red, etc. Rigorous analyses of both the ammonia and the citrate content of the salt show it to be the tri-ammonium citrate. Further investigation of its physical-chemical properties is being made.

As the method of preparation is simple and inexpensive and the yield good, it is evident that this means a solution of the difficult problem of the fertilizer chemist in the preparation of neutral ammonium citrate solution for the determination of the insoluble phosphoric acid in fertilizer analysis.

G. O. JAMES,

Corresponding Secretary

¹This body was first prepared by this method two years ago at the time of the investigation of the conductivity method of preparing neutral ammonium citrate solutions, but a press of other research prevented its analysis and complete identification until the present time.